

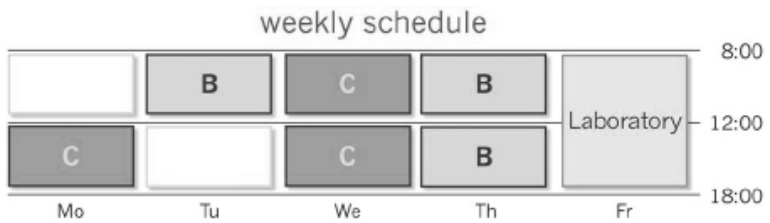
Bonn-Cologne Graduate School
of Physics and Astronomy



Course Overview

Winter Term 2015/2016





Time frame for the coordinated studies programme at Bonn (B) and Cologne (C). The marked areas indicate scheduling of the most attractive courses for students from the partner institution. Fridays are reserved for early integration into research groups.

BCGS Course Overview

Winter Term 2015/2016

This list of courses provides an overview of lectures and seminars offered within the Master course programmes in Bonn and Cologne.

Certain courses are assigned as “Special BCGS Courses” such as joined courses given by lecturers from both universities, courses broadcasted to the other university by video conference, courses given as teaching exchange between both universities, or (lab) courses facilitating an early access into research. Courses of special relevance for students of the partner university have been scheduled within the BCGS time frame enabling students to travel to the partner university (see adjacent figure).

Further, you will find courses classified according to the three main research areas covered by the Graduate School: Particle and Nuclear Physics · Astronomy and Astrophysics · Condensed Matter and Statistical Physics, Photonics.

You may choose your personal curriculum with respect to your scientific interests within the terms of the corresponding Master programmes in Bonn and Cologne. In case you need any support do not hesitate to ask your mentors or the administration.

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List of Abbreviations

Institutes in Bonn

- PI - Physikalisches Institut
Nussallee 12, 53115 Bonn
- HISKP - Helmholtz - Institut für Strahlen- und Kernphysik
Nussallee 14-16, 53115 Bonn
- IAP - Institut für Angewandte Physik
Wegelerstr. 8, 53115 Bonn
- AlfA - Argelander-Institut für Astronomie
Auf dem Hügel 71, 53121 Bonn

- MPIfR - Max-Planck-Institut für Radioastronomie
Auf dem Hügel 69, 53121 Bonn

Institutes in Cologne

- I. PI - I. Physikalisches Institut
- II. PI - II. Physikalisches Institut
- IKP - Institut für Kernphysik
- THP - Institut für Theoretische Physik
Zùlpicher Str. 77, 50937 Köln


- THP NB - Neubau Institut für Theoretische Physik
Zùlpicher Str. 77a, 50937 Köln

Rooms

- SR - Seminar Room
- CR - Conference Room
- KOSMA - KOSMA Room
- Lib - Library
- LH - Lecture Hall

Video Conference 

Teaching Exchange 

Joined Course 

Special BCGS Courses

Lectures

physics614	Laser Physics and Nonlinear Optics Tu 10-12, Th 14-16, LH, IAP, Bonn Exercises: 1 hr in groups included	M. Weitz
physics615	 Theoretical Particle Physics Tu 16-18, Th 9, LH I, PI, Bonn Exercises: 2 hrs in groups Video broadcast on demand, please contact forste@th.physik.uni-bonn.de	M. Drees
physics620	Advanced Atomic, Molecular and Optical Physics Tu 12-14, Th 10-12, LH, IAP, Bonn Exercises: 1 hr in groups included	D. Meschede
physics742	Ultracold Atomic Gases: Experiment and Theory Tu 14-16, Th 12-14, LH, IAP, Bonn Exercises: 1 hr in groups included	M. Köhl
astro811	Stars and stellar evolution Th 9-11, R 0.012, Fr 8.45, Cip-Pool, AlfA, Bonn Exercises: 2 hrs in groups	N. Langer, R. Stancliffe
astro812	Cosmology Tu 10-13.15, R 0.008, AlfA, Bonn Exercises: 1 hr in groups	H. Hildebrandt, P. Schneider
53104	Computational Soft Matter Physics 2 hrs lectures & 1 hr exercises Tu 14-16.45, CR THP, Cologne	G. Gompper
53106	Computational Complexity and Physics 3 hrs lectures & 1 hr exercises Mo 14-15.30, We 10-11.30, CR THP, Cologne	D. Gross
53108	Condensed Matter Physics I 3 hrs lectures & 1 hr tutorials Tu 10-11.30, Th 12-13.30 SR II, PH, Cologne Video broadcast to Bonn: CR II, PIS	M. Grüninger

Special BCGS Courses

53110	Relativity and Cosmology I 4 hrs Mo 16-17.30, We 10-11.30 SR THP Exercises: 2 hrs Th 14-15.30, CR1 THP NB, Cologne	C. Kiefer
53113	Introduction to Biophysics 4 hrs Mo 14-15.30 SR IKP, We 14-15.30 SR THP Exercises: 2 hrs We 17-18.30, SR THP, Cologne	B. Maier
53116	Solid State Theory 3 hrs lectures & 1 hr tutorials every second week Th 8-9.30, SR THP, Fr 12-13.30, SR II.PI, Cologne	A. Rosch

Due to technical support issues, lectures by video might be shifted to other rooms on short notice. Please check the BCGS website and local announcements.

If you are interested in a specific course but are unable to travel, please inquire if video broadcast is possible.

Intensive Courses

physics737	BCGS Intensive Week (Advanced Topics in Photonics and Quantum Optics): Build Your Own Laser, Bonn September 7-11, 2015	F. Vewinger
physics719	BCGS Intensive Week (Advanced Topics in High Energy Physics): From Hits to Higgs - a Discovery Simulation for Physics at the LHC, Bonn October 12-16, 2015, for more information see http://pi.physik.uni-bonn.de/~evt/teaching/intensiveweek15/	E. von Törne
53130	BCGS Intensive Week: Simulations for Experimental Nuclear Physics - Hands-on, Cologne, October 12-16, 2015, see http://www.ikp.uni-koeln.de/students/iw-simul/index.html	A. Blazhev, M. Labiche, H. Weick, N. Warr

53131	BCGS Intensive Week: Spectroscopic characterization of the electronic and vibrational structure of surfaces and solids, Cologne, October 12-16, 2015	A. Grüneis
53132	BCGS Intensive Week: Experiment and Simulation on Biological Systems, Cologne February 22-26, 2016 Please note: number of participants is limited to 8. Information on application will be published soon on: http://www.biophysics.uni-koeln.de/	B. Maier, J. Berg
53133	BCGS Intensive Week: Advanced Materials Cologne, March 14-18, 2016	J. Hemberger
	BCGS Intensive Week: Condensed Matter Physics, Cologne February or March 2016 Details will be announced soon.	P. van Loosdrecht, F. Parmigiani
	Research Internships Students become a temporary member of a research group for a typical duration of four weeks, further information: http://www.gradschool.physics.uni-koeln.de for similar courses, see	
physics717	High Energy Physics Lab, Bonn 4 to 6 weeks on agreement	E. von Törne
physics732	Optics Lab, Bonn 4 to 6 weeks on agreement http://www.iap.uni-bonn.de/opticslab/	F. Vewinger, M. Köhl, S. Linden, D. Meschede, M. Weitz
53199	Miniforschung (Internship during semester break for advanced students), Cologne	Professors and Lecturers of the Physics Institutes

General Courses

physics606	Advanced Quantum Theory Mo 12-14, We 13, LH I, PI, Bonn Exercises: 2 hrs in groups	H. Dreiner
physics751	Group Theory We 11, LH IAP, Th 10-12, LH, HISKP, Bonn Exercises: 2 hrs in groups	U. Meißner, A. Rusetsky
physics760	Computational Physics We 10-12, LH, HISKP, Bonn Exercises: 2 hrs in groups	C. Urbach, M. Pletschlies
physics774	Electronics for Physicists Tu 12-14, Th 13, LH, HISKP, Bonn Exercises: 1 hr in groups	P.-D. Eversheim
6839	Public Presentation of Science 2 hrs on agreement, Bonn	H. Dreiner
53080	Advanced Statistical Physics 4 hrs Tu 14-15.30, Th 10-11.30, LH III, Cologne Exercises: 2 hrs Mo upon agreement	T. Nattermann
53082	Advanced Quantum Mechanics 4 hrs Mo 10-11.30, Tu 8-9.30, LH III, Cologne Exercises: 2 hrs We upon agreement	S. Trebst
53120	Energy Supply 2 hrs We 14-15.30, SR I, PI, Cologne	A. Dewald

Particle and Nuclear Physics

physics611	Particle Physics Tu, Th 14-16, LH, HISKP, Bonn Exercises: 1 hr in groups included	B. Ketzner
physics612	Accelerator Physics We, Th 10-12, SR I, HISKP, Bonn Exercises: 1 hr in groups included	W. Hillert
physics616	Theoretical Hadron Physics We 14-17, SR I, HISKP, Bonn Exercises: 2 hrs in groups	C. Hanhart, A. Wirzba
physics618	Physics of Particle Detectors Tu 10-12, Th 12, SR I, HISKP, Bonn Exercises: 1 hr in groups	J. Dingfelder
physics715	Experiments on the Structure of Hadrons Mo 14-16, LH, IAP, Bonn Exercises: 1 hr in groups	H. Schmieden
physics720	Physics with Antiprotons We 14-16, SR II, HISKP, Bonn	A. Gillitzer
physics7501	Advanced Quantum Field Theory Mo 12-14, We 13, LH, HISKP, Bonn Exercises: 2 hrs in groups	A. Klemm
physics752	Superstring Theory Th 13, Fr 12-14, LH I, PI, Bonn Exercises: 2 hrs in groups	S. Förste
physics654	Seminar on Topics in Advanced Quantum Field Theory tba, Bonn	H. Dreiner, B. Kubis, H.-P. Nilles
53105	Tools for Particle Physics 2 hrs on appointment, SR IKP, Cologne	D. Gotta, H. Ströher, mit M. Hartmann und I. Keshalashvili

Particle and Nuclear Physics

53114	Nuclear Physics II 3 hrs We 16.-16.45, Fr 10-11.30, SR IKP, Cologne	P. Reiter
53401	Advanced Seminar on Nuclear Physics with Stored Ions 2 hrs We 16-17.30, Lib IKP, Cologne	A. Blazhev
53404	Advanced Seminar on Nuclear Physics 2 hrs We 14-15.30, SR IKP, Cologne	D. Gotta, J. Jolie, A. Zilges, P. Reiter, H. Ströher, A. Dewald, mit M. Hartmann und I. Keshalashvili
53410	Advanced Seminar on Gauge Theory: on swimming, synthetic gauge fields and elementary particles 2 hrs Fr 10-11.30, SR THP, Cologne	T. Quella, M. Zirnbauer

Astronomy and Astrophysics

astro608	Theoretical Astrophysics We 12, Th 11-13, R 0.012, AlfA, Bonn Exercises: 2 hrs in groups	C. Porciani
astro801	Introduction to Astrophysics Details to be announced, Bonn	P. Schneider
astro811	Stars and stellar evolution Th 9-11, R 0.012, Fr 8.45, Cip-Pool, AlfA, Bonn Exercises: 2 hrs in groups	N. Langer, R. Stancliffe
astro841	Radio astronomy: tools, applications and impacts Tu 16, Th 16-18, R 0.012, AlfA, Bonn Exercises: 2 hrs in groups	N. Ben Bekhti, H. Junklewitz, U. Klein
astro8503	Radio and x-ray observations of dark matter and dark energy Fr 13-15, R 0.008, AlfA, Bonn Exercises: 2 hrs in groups	J. Kerp, T. Reiprich, Y. Zhang

astro853	The physics of dense stellar systems Mo 15-17, R 3.010, AlfA, Bonn Exercises: 2 hrs in groups	P. Kroupa
astro854	Numerical gravitational dynamics Th 14-16, R 0.008, AlfA, Bonn Exercises: 1 hr in groups	J. Pflamm-Altenburg
astro856	Quasars and microquasars Th 13-15, R 0.01, MPIfR, Bonn	M. Massi
astro891	Seminar on cosmology Tu 14-16, R 3.010, AlfA, Bonn initial meeting see astro 894	C. Porciani, T. Reiprich, P. Schneider
astro892	Seminar on radio astronomy Th 14-15, R 0.012, AlfA, Bonn initial meeting see astro 894	F. Bertoldi, J. Kerp, U. Klein, M. Kramer, M. Massi, K. Menten
astro893	Seminar on stars, stellar systems, and galaxies Tu 16-17.30, R 3.010, AlfA, Bonn initial meeting see astro 894	P. Kroupa, J. Pflamm-Altenburg
astro894	Seminar on astronomy and astrophysics Mo 14-15.30, R 0.008, AlfA, Bonn	Y. Zhang, F. Bertoldi, J. Kerp, U. Klein, M. Kramer, P. Kroupa, N. Langer, M. Massi, K. Menten, C. Porciani, T. Reiprich, P. Schneider, T. Tauris
6952	Seminar on theoretical dynamics Fr 14-16, R 3.010, AlfA, Bonn	P. Kroupa, J. Pflamm-Altenburg
6953	Seminar on stellar evolution and hydrodynamics Th 13.30-15, R 3.010, AlfA, Bonn	N. Langer
6954	Seminar on galaxy clusters Th 15-16.30, R 0.006, AlfA, Bonn	T. Reiprich, Y. Zhang
6955	Seminar on selected problems in extragalactic astronomy and cosmology Th 16-18, R 3.010, AlfA, Bonn	C. Porciani, P. Schneider

Astronomy and Astrophysics

53103	Advanced Astrophysics 4 hrs We 12-13.30, Fr 16-17.30, SR I. PI, Cologne Exercises: 1 hr Tu 16-17.30 on appointment	A. Eckart
53111	Measurement Techniques in Molecular Physics 2 hrs Th 12-13.30, CR THP, Cologne	A. Kiendler-Scharr
53117	Molecular Physics I 3 hrs Tu 12-13.30, Fr 14, SR I. PI, Problem Class: 1 hr Fr 15 SR I. PI, Cologne	S. Schlemmer
53118	Star formation 2 hrs Th 10-11.30, CR THP, Cologne	S. Walch
53405	Advanced Seminar on Topical Subjects of Astrophysics 2 hrs Mo 14-15.30, SR I. PI, Cologne	A. Eckart, L. Labadie, P. Schilke, S. Schlemmer, J. Stutzki
53411	Advanced Seminar on Introduction to Cosmology 2 hrs Th 17-18.30, CR THP, Cologne	M. Janßen, J. Hajdu

Condensed Matter and Statistical Physics, Photonics

physics617	Theoretical Condensed Matter Physics Tu 14-16, Th 12, LH I, PI, Bonn Exercises: 2 hrs in groups	H. Monien
physics740	Hands-on Seminar: Experimental Optics and Atomic Physics Mo 9-11, IAP, Bonn	M. Weitz and co-workers
physics772	Physics in Medicine I: Fundamentals of Analyzing Biomedical Signals Mo 10-12, We 12, SR I, HISKP, Bonn Exercises: 1 hr in groups	K. Lehnertz

physics776	Physics in Medicine III: Physics of Magnetic Resonance Imaging Tu 14-16, Th 16, SR II, HISKP, Bonn Exercises: 1 hr in groups	T. Stöcker
physics652	Seminar Photonics/Quantum Optics We 14-16, LH, IAP, Bonn	F. Vewinger
physics655	Computational Physics Seminar on Analyzing Biomedical Signals Mo 14-16, SR I, HISKP, Bonn	K. Lehnertz, B. Metsch
physics657	Seminar on Advanced Topics in Surface Science Physics Mo 14-16, LH, IAP, Bonn	E. Soergel
53100	Quantum Field Theory II 4 hrs We 8-9.30, LH II, Fr 8-9.30, SR I. PI, Exercises: 2 hrs Th 10-11.30, SR THP, Cologne	D. Bagrets
53101	Neutron scattering techniques: an introduction with topical problems 2 hrs We 10-11.30, SR II. PI, Cologne	M. Braden
53107	Solid State Spectroscopy 2 hrs We 14-15.30, CR I, THP NB, Cologne Exercises: 1 hr We 17, SR II. PI	A. Grüneis
53111	Measurement Techniques in Molecular Physics 2 hrs Th 12-13.30, CR THP, Cologne	A. Kiendler-Scharr
53112	Superconductivity 2 hrs Mo 10-11.30, SR II. PI, Cologne	P. van Loosdrecht
53115	High Temperature Superconductors 2 hrs Fr 14-15.30, SR II. PI, Cologne	J. Röhler
53117	Molecular Physics I 3 hrs Tu 12-13.30, Fr 14, SR I. PI, Problem Class: 1 hr Fr 15 SR I. PI, Cologne	S. Schlemmer

Condensed Matter and Statistical Physics, Photonics

53119	Many-body quantum optics 2 hrs Th 16-17.30, CR I, THP NB, Cologne	P. Strack
53142	Memristive Phenomena - From Fundamental Physics to Neuromorphic Computing 47th IFF-Spring School, 22.02. - 04.03.2016 see: http://www.iff-springschool.de	P.S. Bechthold, C. Buchal, D.E. Bürgler, G. Gompper, R. Wördenweber
53402	Advanced Seminar on Current Problems in Solid State Physics: "Exotic Quasiparticles in Condensed Matter" 2 hrs Mo 14-15.30, SR II. PI, Cologne First meeting: Mo 19.10.2015, 14 h see: http://www.ph2.uni-koeln.de/561.html	M. Braden, A. Grüneis, M. Grüninger, P. van Loosdrecht, T. Michely, J. Hemberger, T. Lorenz
53403	Advanced Seminar Philosophy of Quantum Theory 2 hrs Th 12-13.30, SR THP, Cologne	C. Kiefer with A. Hüttemann
53410	Advanced Seminar on Gauge Theory: on swimming, synthetic gauge fields and elementary particles 2 hrs Fr 10-11.30, SR THP, Cologne	T. Quella, M. Zirnbauer

BCGS Grand Opening

We cordially invite all BCGS members to our welcome party for our new students. The festive event to open the academic year will take place

November 13th, 2015
Wolfgang-Paul Hörsaal,
Kreuzbergweg 28 in 53115 Bonn

The colloquium talk will be given at 16h by

Professor Dr. Katherine Freese
University of Michigan/University of Stockholm

Professor Freese is an expert in the field of dark matter and dark energy. The complete program will be presented on our webpage before long.



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